

REMARKS

Applicants submit a Petition and Fee for a One-Month Extension of Time.

An excess claim fee payment letter is submitted herewith for four (4) additional claims.

Claims 1-13, 15, and 17 - 37 are all the claims presently pending in the application.

Claims 1-7, 9, 11, 13, 18-23, and 27-31 are amended to more clearly define the invention.

Claims 34-37 are added. Claims 1, 13, 20, and 28-29 are independent.

Applicants thank Examiners Lopez and Sipos for the courtesies extended to Applicants' representative during the personal interview on February 3, 2005. During the interview, Examiners Lopez and Sipos agreed that the amendments to claims 1-7, 9, 11, 13, 18-23, and 27-31 that clarify that the gear is fixed relative to the housing clearly distinguishes over the applied references.

In particular, this Amendment amends some of the claims to clarify that the gear of the speed reduction mechanism is fixed relative to a housing, to amend some of the claims to recite an end tool to output a rotational impact, and to amend claim 20 to recite the structural features in a more positive manner than in a narrative manner in accordance with the very kind suggestions of the Examiners.

These amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability.

Applicants also note that, notwithstanding any claim amendments herein or later during prosecution, Applicants' intent is to encompass equivalents of all claim elements.

Claims 1-13, 15, and 17-33 stand rejected under 35 U.S.C. § 103(a) as being

unpatentable over the Morita et al. reference in view of the Kawasaki et al. reference.

This rejection is respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

A first exemplary embodiment of the claimed invention, as defined, for example, by claims 1, 13, and 20, are directed to an impact tool for imparting a rotational impact force to an end tool, powered by a driving force. The impact tool includes a housing, a gear fixed relative to the housing and an impact damping mechanism for damping the rotational impact force on a speed reduction mechanism in a direction of rotation of the gear. The gear being arranged relative to the housing such that the gear is only slightly rotatable relative to the housing.

In such a power tool, an impacting reactive force is generated in the striking mechanism portion by a striking action, the impacting reactive force is transmitted from the striking mechanism portion to the fixed gear, and an impacting torque in a direction of a rotation of the fixed gear is added between the fixed gear and a fixed gear support jig supporting the fixed gear (or a housing). Therefore, there is a problem that damage to the fixed gear and the fixed gear support jig (or the housing) is especially large.

The present invention provides an impact damping mechanism for damping an impact force on a speed reduction mechanism in a direction of rotation of the gear. Therefore, the present invention dampens the impacting torque added between the fixed gear and the fixed gear support jig (or the housing) and extends the life time of the gear and the fixed gear support jig (or the housing).

A second exemplary embodiment of the claimed invention, as defined, for example,

by independent claim 28, is directed to a tool for imparting a rotational impact force to an end tool. The tool includes a drive source, a housing, a speed reducer that includes a fixed gear support jig that is fixedly supported by the housing, and a gear that is arranged relative to the housing by the fixed gear support jig and that transmits a rotational movement from the drive source. The tool further includes a striking mechanism that converts the rotational movement into a striking force, and an impact damping mechanism that dampens a rotational impact between the gear and the housing. The gear being arranged relative to the housing such that the gear is only slightly rotatable relative to the housing.

In this manner, the present invention inhibits an impact force from damaging the speed reducer by absorbing impacts between the gear and the housing.

A third exemplary embodiment of the claimed invention, as defined, for example, by independent claim 29, is directed to a power tool for imparting a rotational impact force to an end tool. The power tool includes a main body portion having a housing, a motor serving as a drive source, a speed reduction mechanism portion for transmitting a rotational power of the motor, and a mechanical portion for transmitting the rotational power of the speed reduction mechanism portion to an end tool. The power tool also includes a handle portion connected to the main body portion. The speed reduction mechanism portion includes a gear that is arranged relative to the housing and having another gear in an inner periphery of the gear, and a fixed gear support member that holds the gear. A projection extends toward the motor from a side of the gear, and a hole portion, that engages the projection, is defined in the support member.

In this manner, the gear can be supported by the fixed gear support member without increasing the outer diameter of the fixed gear support member and the tool.

II. THE PRIOR ART REJECTION

The Examiner alleged that the Kawasaki et al. reference would have been combined with the Morita et al. reference to form the claimed invention. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

As agreed by the Examiners during the personal interview, these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

Specifically, the Morita et al. reference is directed to damping oscillations that may occur in the transmission of torque of an engine starter (col. 1, lines 36-39).

In stark contrast, the Kawasaki et al. reference is directed to providing a percussion hammer tool with reduced noises (col. 2, lines 36-45).

In other words, one of ordinary skill in the art who was concerned with providing an engine starter which dampens oscillations as the Morita et al. reference is concerned with providing would not have referred to the Kawasaki et al. reference because the Kawasaki et al. reference is directly to the completely opposite goal of providing a tool that generates oscillations (i.e. percussions) quietly.

Clearly, the Morita et al. reference has a completely different function than the Kawasaki et al. reference, thus, there is no motivation to combine the Morita et al. reference with the Kawasaki et al. reference. Therefore, the references would not have been combined, absent hindsight.

Further, as also agreed by the Examiners during the personal interview, the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged

by the Examiner.

The Examiner alleged that it would have been obvious to one having ordinary skill in the art to "have provided Morita's invention with a striking mechanism portion having an end tool in order to convert and transmit a rotational force from a driven source into a striking force, outputting the striking force and rotation force through the striking mechanism via the tool '16.'"

Firstly, contrary to the Examiner's prior allegation, one of ordinary skill in the art would not have been motivated to modify the engine starter that is disclosed by the Morita et al. reference to include the striking mechanism that is disclosed by the Kawasaki et al. reference because such a modification would change the principle of operation of the Morita et al. reference.

M.P.E.P. § 2143.01 states:

"If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious." (Emphasis added).

The Morita et al. reference discloses an engine starter that includes a motor M, a speed reduction mechanism (driving gear 26 and driven gear 27), a one-way clutch C, and an output pinon gear 33. All of these elements operate to smoothly reduce the speed of the motor M to a slower speed at the output pinon gear 33 while simultaneously multiplying the torque output from the motor M to a higher output torque at the pinon gear 33. The Morita et al. reference clearly does not disclose anything at all within the engine starter which operates to convert a rotary motion into an impacting/percussion type of motion.

Indeed, the entire objective of the Morita et al. reference is to “damp oscillations that may occur in the transmission torque.” (Emphasis added, col. 2, lines 36-45). The Morita et al. reference discloses providing a torque damper Dt which operates to dampen any such oscillations, impacts, and/or percussions.

In stark contrast, the Kawasaki et al. reference discloses percussion hammer that includes a drive section Y, that includes a motor M, and a percussion operating section Z. The percussion operating section Z operates to convert the relatively smooth output from the motor M into an impacting/percussion type of motion in a rotary direction.

Therefore, clearly the principle of operation of the engine starter of the Morita et al. reference of damping impacts in a transmission torque would be completely changed if the engine starter of the Morita et al. reference were modified to include the striking mechanism disclosed by the Kawasaki et al. reference.

Secondly, contrary to the Examiner’s prior allegation, one of ordinary skill in the art would not have been motivated to modify the engine starter that is disclosed by the Morita et al. reference to include the striking mechanism that is disclosed by the Kawasaki et al. reference because such a modification would render the engine starter useless for its intended purpose.

M.P.E.P. § 2143.01 states:

“If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.” (Emphasis added).

The engine starter that is disclosed by the Morita et al. reference is entirely directed to providing smooth relatively constant rotary speed output having a high torque so that the

crankshaft of the engine to which the engine starter is attached may be rotated smoothly in order to initiate intake, compression and exhaust of air and fuel so that the engine may be started.

In stark contrast, the striking mechanism portion that is disclosed by the Kawasaki et al. reference is directed to converting the relatively smooth rotary output of the motor into an impacting rotary output. In other words, the output provided by the striking mechanism is an oscillating or pulsing output.

If one were to modify the engine starter that is disclosed by the Morita et al. reference to include the striking mechanism portion, then the engine starter would output an impacting output to the crankshaft of an engine. Such an impacting rotation of a crankshaft would not provide the necessary rotary inertia, nor intake, compression and exhaust of air and fuel which is necessary to start the engine. Thus, the engine starter would not be able to start an engine.

In other words, the Examiner's alleged modification would render the engine starter that is disclosed by the Morita et al. reference useless for its intended purpose.

Thirdly, contrary to the Examiner's previous allegation, one of ordinary skill in the art would not have been motivated to modify the engine starter that is disclosed by the Morita et al. reference to include the striking mechanism that is disclosed by the Kawasaki et al. reference because the Morita et al. reference teaches away from such a modification.

M.P.E.P. § 2145 X. D. 2. states:

"It is improper to combine references where the references teach away from their combination." (Emphasis added).

The entire purpose and object of the invention that is disclosed by the Morita et al.

reference is to providing a “torque damper whereby the transmitted torque will be damped and engine noise reduced.” (Emphasis added, Abstract). The object of the invention disclosed by the Morita et al. reference is to provide a “torque damper that is effective to damp oscillations that may occur in the transmission torque.” (Emphasis added, col. 1, lines 36-39).

The Examiner alleged that it would have been obvious to modify the engine starter of the Morita et al. reference to include the striking mechanism that is disclosed by the Kawasaki et al. reference.

However, as explained above, the object of the striking mechanism that is disclosed by the Kawasaki et al. reference is to convert the smooth rotary motion from the motor M into a percussive output. In other words, the entire purpose of the striking mechanism that is disclosed by the Kawasaki et al. reference is to provide an oscillating output.

Clearly, one of ordinary skill in the art would not have been motivated to modify the engine starter that is disclosed by the Morita et al. reference to include the striking mechanism which provides an oscillating output when the Morita et al. reference teaches away from providing an oscillating output.

Further, as agreed by the Examiners during the February 3, 2005, personal interview, even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention.

None of the applied references teaches or suggest the features of the claimed invention including: an impact damping mechanism for damping the rotational impact force on a speed reduction mechanism in a direction of rotation of the fixed gear (claims 1, 13, and 20); 2) an

impact damping mechanism between the speed reduction device and the housing (claim 28); and 3) a projection that extends toward the motor from a side of the fixed gear, and a hole portion that engages the projection is defined in the support member (claim 29).

As explained above, these features are important for dampening the impacting torque between the gear and the fixed gear support jig (or the housing), extending the life time of the gear and the fixed gear support jig (or the housing), inhibiting an impact force from damaging the speed reduction device by absorbing impacts between the speed reduction device and the housing and supporting the gear with the fixed gear support member without increasing the outer diameter of the fixed gear support member and the tool.

None of the applied references teaches or suggest the features of the claimed invention including an impact damping mechanism for damping the rotational impact force on a speed reduction mechanism in a direction of rotation of the gear (claims 1, 13, and 20).

Indeed, contrary to the Examiner's allegations, the Morita et al. reference does not teach or suggest a gear that is arranged relative to the housing such that the gear is only slightly rotatable relative to the housing, let alone an impact damping mechanism for damping a rotational impact force on a speed reduction mechanism in a direction of rotation of the gear.

The Examiner refers to the driven gear 27 in an attempt to support the Examiner's allegation that the Morita et al. reference discloses a gear that is arranged relative to the housing such that the gear is only slightly rotatable relative to the housing.

However, in stark contrast to the Examiner's allegation, the driven gear 27 of the engine starter that is disclosed by the Morita et al. reference clearly is not arranged relative to the housing such that the gear is only slightly rotatable relative to the housing. Rather, the

"driven gear 27 of relatively large diameter [is] rotatably supported on the outer peripheral surface of the output shaft 23 and [meshes] with the driving gear 26" (col. 2, line 66 - col. 3, line 1), "the output shaft 23 is driven at a reduced speed by the rotation of the rotor shaft 6 though the driving gear 26, the driven gear 27 and further through the torque damper Dt" (col. 5, lines 47-50).

Therefore, contrary to the Examiner's previous allegation, the Morita et al. reference clearly does not teach or suggest a gear that is arranged relative to the housing such that the gear is only slightly rotatable relative to the housing, let alone an impact damping mechanism for damping a rotational impact force on a speed reduction mechanism in a direction of rotation of the gear.

The Examiner further mischaracterizes the engine starter that is disclosed by the Morita et al. reference by referring to a clutch outer member 30 in an attempt to support the Examiner's allegation that the Morita et al. discloses a fixed gear support jig.

The Morita et al. reference very clearly explains that "the unidirectional clutch C comprises a clutch outer member 30 [that is] rotatably supported by the output shaft 23" (emphasis added, col. 3, lines 5-8) and that "the driven gear 27 drives the clutch outer members 30" (col. 3, lines 28-30). In other words, the rotation of the driven gear 27 (col. 5, lines 47-50), clearly drives the clutch outer members 20 to also rotate.

Therefore, clearly, the clutch outer members 30 do not correspond to the claimed fixed gear support jig.

The Kawasaki et al. reference does not remedy the deficiencies of the Morita et al. reference. The Kawasaki et al. reference does not teach or suggest an impact damping mechanism for damping the rotational impact force on a speed reduction mechanism in a

direction of rotation of the fixed gear as recited by claims 1, 13, and 20.

Indeed, the Examiner has admitted that the Kawasaki et al. reference does not teach or suggest this feature of the present invention (see March 23, 2004, Office Action).

Further, none of the applied references teaches or suggest the features of the claimed invention including an impact damping mechanism between the speed reduction device and the housing as recited by claim 28.

Indeed, the Examiner fails to present a *prima facie* case of obviousness because the Examiner failed to cite any reference at all that discloses this feature.

Applicants submit that the Examiner did not cite any reference that teaches or suggests this feature because it is not possible to make any such citation because the applied reference simply do not teach or suggest this feature.

The Morita et al. reference discloses a torque damper Dt between a driven gear 27 and a clutch C. Clearly, the Morita et al. reference does not teach or suggest an impact damping mechanism between the speed reduction device and the housing as recited by claim 28.

The Kawasaki et al. reference does not remedy the deficiencies of the Morita et al. reference.

Rather, the Kawasaki et al. reference merely discloses a cushion member 10 between the engaging portion 7 of an anvil and a tip tool holding portion 8 that absorbs an axial component of a percussion force.

Lastly, none of the applied references teaches or suggest the features of the claimed invention including a projection that extends toward the motor from a side of the fixed gear, and a hole portion that engages the projection is defined in the support member (claim 29).

The Examiner admits that the projection 59 from the “fixed” gear 27 (“fixed” being

debunked above), does not extend toward the motor. However, the Examiner alleges:

“it would have been obvious to one having ordinary skills in the art at the time the invention was made to have provided Morita’s projection ‘59’ extending toward the motor, since it has been held that rearranging parts of an invention involves only routine skill in the art, and it appears that the invention would perform equally with projection ‘59’ formed on the outer surface of the fixed gear 27 inserted between the impact damping members for the purpose of damping an impact on the speed reduction mechanism portion in a direction of rotation of the fixed gear 27.”

Contrary to Examiner’s allegations, “rearranging” the driven gear 27 to provide the projection 59 on the driven gear such that it extends toward the motor as recited by claim 29, would render the engine starter inoperable.

“The projections are formed on the facing side surface of the driven gear 27 and project into respective chambers 58.” (Col. 6, lines 63-65) The “damper chamber 58 that is formed on the surface of the clutch outer (sic) 30 [is] disposed in opposed facing relation to the driven gear 27.” (Col. 6, lines 54-56).

Therefore, the Examiner’s “rearrangement” of the projection 59 toward the motor would effectively disconnect the driven gear 27 from the clutch C and, thereby, render the engine starter inoperable.

Further, should the Examiner allege a further modification of “rearranging” the clutch C to also be toward the motor from the driven gear 27. Such a modification would render the clutch useless as the only purpose for providing the clutch is to transfer the rotational motion of the driven gear to the output shaft.

Clearly, contrary to the Examiner's allegations, modifying the driven gear 27 to face toward the motor would certainly not enable the engine starter to "perform equally" as well as the disclosed configuration. Rather, the Examiner's alleged modification would render the engine starter useless for its intended purpose.

Therefore, the Examiner is respectfully requested to withdraw the rejection of claims 1-13, 15, and 17-33 as agreed during the February 3, 2005, personal interview.

III. FORMAL MATTERS AND CONCLUSION

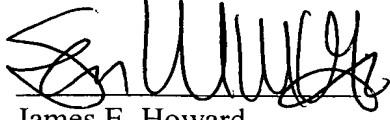
In view of the foregoing amendments and remarks, and the agreements reached during the personal interview, Applicants respectfully submit that claims 1-13, 15, and 17 - 37, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 2/28/05


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